

# ADJUSTABLE GARMENT ROD

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

The present invention relates to a garment rod, and more particularly to an adjustable garment rod with a conveniently adjustable angle of suspension.

### 2. Description of Related Art

With reference to Fig. 7, a conventional adjustable garment rod (6) in accordance with prior art comprises a mounting bracket (60), a pivot seat (74), a suspension arm (70) and multiple restitution springs (75). The mounting bracket (60) attaches the garment rod (6) to a post (69). The pivot seat (74) is mounted pivotally in the mounting bracket (60). The suspension arm (70) is attached to and is held by the pivot seat (74) so that the angular position of the suspension arm (70) can be adjusted.

The mounting bracket (60) comprises a bracket body (61) and a mounting ring (62). The bracket body (61) has transverse slot (610), two upper lips (611) and two lower lips (612) where only one upper lip (611) and one lower lip (612) are shown in the Fig. 7. The transverse slot (610) is defined between the upper and the lower lips (611, 612). The upper lips (611) are formed alongside the transverse slot (610), and each of the upper lip (611) has a curved edge (614) and multiple seat detents (615). The seat detents (615) are defined in the curved edge (614). Likewise, the lower lips (612) are formed alongside the transverse slot (610), and each of them has a curved edge (616) and multiple arm detents (617). The curved edges (616) of the lower lips (612) are opposite to the curved edges (614) of the upper lips (615). The arm detents (617) are defined in the

1 curved edges (616). The mounting ring (62) connects to the bracket body (61)  
2 and is attached to the post (69).

3 The pivot seat (74) is mounted pivotally in the transverse slot (610) by a  
4 pivot fastener (63) and has an engaging ball (76) and an arm passage (741). The  
5 engaging ball (76) selectively corresponds to the seat detents (615) and is held in  
6 one of the seat detents (615) to hold the pivot seat (74) in position. The arm  
7 passage (741) holds the suspension arm (70).

8 The suspension arm (70) has an insert (72), a top edge (701), at least one  
9 hanging recess (71) and two positioning studs (73). The insert (72) is inserted  
10 into and held in the arm passage (741) and has an elongated hole (721) and an  
11 inside end (722). The elongated hole (721) holds slidably the pivot fastener (63).  
12 The at least one hanging recess (71) is defined along the top edge (701). The  
13 positioning studs (73) protrude alongside the insert (72) and extend respectively  
14 toward the lower lips (612) of the bracket body (61). The positioning studs (73)  
15 correspond respectively to the lower lips (612), engage selectively the arm  
16 detents (617) in the corresponding lower lip (612) to position the suspension arm  
17 (70).

18 The restitution springs (75) are mounted in the arm passage (741) and  
19 provide a restitution force on the inside end (722) of the insert (72) so the  
20 positioning studs (73) can be firmly held in the corresponding arm detents (617).  
21 Therefore, the suspension arm (70) can be maintained at a given angular position  
22 when the positioning studs (73) engage and are held in the arm detents (617).

23 The suspension arm (70) is adjusted by pushing the suspension arm (70)  
24 into the arm passage (741) until the positioning studs (73) disengage from the

1 arm detents (617). The suspension arm (70) can be pivoted about the pivot  
2 fastener (63) to change its angular position because the positioning studs (73) are  
3 out of the arm detents (617). When the suspension arm (70) is pivoted, the  
4 engaging ball (76) will slide out of the current seat detent (615) and slip into the  
5 adjacent seat detent (615) and make a clicking sound.

6           However, operating the conventional garment rod (6) requires that the  
7 suspension arm (70) always be pushed into the arm passage (741) before the  
8 suspension arm (70) can be adjusted. Since the suspension arm (70) must be  
9 pushed against the restitution springs (75) before the angular position of the  
10 suspension arm (70) can be changed, the conventional garment rod (6) is  
11 inconvenient to use.

12           Since the positioning studs (73) bear virtually all of the weight hanging  
13 on the suspension arm (70), the positioning studs (73) limit the weight of objects  
14 that can be hung on the conventional garment rod (6). When the conventional  
15 garment rod (6) is made of light material such as plastic, the positioning studs  
16 (73) are too weak to bear a heavy weight and may be broken.

17           The engaging ball (76) in the conventional garment rod (6) engage the  
18 seat detents (615) and provides an auxiliary support to increase the weight  
19 bearing capability of the suspension arm (70). However, the engaging ball (76)  
20 increases the overall complexity of the structure of the garment rod (6) and  
21 makes assembly of the garment rod (6) difficult.

22           With further reference to Fig. 8, another embodiment of a conventional  
23 garment rod (8) in accordance with the prior art modifies the insert (72) and the  
24 pivot seat (74). The modification is implemented with a stationary pivot body

1 (81), two restitution springs (82), a sliding hole (83) and a spring hole (84). The  
2 sliding hole (83) and the spring hole (84) are defined in the inside end (722) of  
3 the insert (72). The stationary pivot body (81) is pivotally mounted in the bracket  
4 body (61), slidably held in the sliding hole (83) and has a blind hole (811). A  
5 restitution spring (82) is mounted and held in the blind hole (811). The engaging  
6 ball (76) is partially held in the blind hole (811), compresses the restitution  
7 spring (82) in the blind hole (811) and engages one of the seat detents (615). The  
8 restitution spring (82) is mounted in the spring hole (84) and has an end abutting  
9 the pivot body (81).

10 The garment rod (8) also needs to be pushed into the bracket body (61)  
11 to disengage the positioning studs (73) from the arm detents (617) to adjust the  
12 garment rod (8). The operation is inconvenient. Also, the garment rod (8) uses  
13 only two restitution springs (82) to provide the restitution force to position the  
14 suspension arm (70), which limits the weight the suspension arm (70) can  
15 support.

16 The aforesaid two garment rods (6, 8) can only be adjusted horizontally,  
17 but cannot be further adjusted upward to approach a vertical position. Therefore,  
18 use of the two conventional rods (6, 8) is restricted.

19 To overcome the shortcomings, the present invention provides an  
20 improved garment rod to mitigate or obviate the aforementioned problems.

## 21 SUMMARY OF THE INVENTION

22 The main objective of the present invention is to provide an improved  
23 adjustable garment rod that uses a suspension arm with toothed protrusions and  
24 an adjustable ratchet mounting bracket with toothed surfaces to firmly position

1 the suspension arm at a given angular position when the toothed protrusions  
2 engage the toothed surfaces.

3 An objective of the present invention is to provide an adjustable garment  
4 rod that is convenient to operate.

5 The adjustable garment rod in accordance with the present invention  
6 includes an adjustable ratchet mounting bracket, an inner housing, a resilient  
7 element and a suspension arm. The adjustable ratchet mounting bracket has an  
8 arm slot and first and second toothed ratchet surfaces formed alongside the arm  
9 slot. The inner housing is rotatably held in the arm slot and holds the suspension  
10 arm with the resilient element. The suspension arm extends out of the arm slot  
11 and has two toothed protrusions. The resilient element provides a restitution  
12 force acting on the suspension arm so that the toothed protrusions engage  
13 respectively the toothed ratchet surfaces to hold firmly the suspension arm at a  
14 given angular position. Further, the garment rod uses several simple parts so that  
15 assembling the garment rod is easy and quick, which saves costs and time.

16 Other objectives, advantages and novel features of the invention will  
17 become more apparent from the following detailed description when taken in  
18 conjunction with the accompanying drawings.

#### 19 BRIEF DESCRIPTION OF THE DRAWINGS

20 Fig. 1 is an exploded perspective view of an adjustable garment rod in  
21 accordance with the present invention;

22 Fig. 2 is an operational side plan view in partial section of a mounting  
23 bracket of the garment rod in Fig. 1;

24 Fig. 3 is an operational side plan view in partial section of the mounting

1 bracket in Fig. 2 with the suspension arm pushed into the mounting bracket;

2 Fig. 4 is an operational side plan view in partial section of the mounting  
3 bracket in Fig. 2 when the suspension arm has been adjusted;

4 Fig. 5 is an operational side plan view in partial section of an alternative  
5 embodiment of the mounting bracket of the garment rod in Fig. 1 with the  
6 garment rod mounted on a post;

7 Fig. 6 is an operational perspective view of two garment rods in Fig. 1  
8 with multiple transverse rods to hang clothes;

9 Fig. 7 is an operational side plan view in partial section of a segment of a  
10 conventional garment rod in accordance with prior art; and

11 Fig. 8 is an operational side plan view in partial section of a segment of  
12 another embodiment of a conventional garment rod in accordance with prior art.

### 13 DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

14 With reference to Figs. 1 and 6, an adjustable garment rod (1) in  
15 accordance with the present invention comprises a mounting bracket (10), an  
16 inner housing (30), a resilient element (40) and a suspension arm (50).

17 The mounting bracket (10) is used to mount the garment rod (1) on a  
18 wall (not numbered), has an arm slot (101) and a ratchet device (not numbered)  
19 and comprises a mounting plate (11) and an outer housing (12). The arm slot  
20 (101) is defined vertically completely through the outer housing (12) of the  
21 mounting bracket (10). The ratchet device may comprise two toothed ratchet  
22 surfaces (102) located alongside the arm slot (101). The mounting plate (11) has  
23 two mounting holes (110). The outer housing (12) is mounted on the mounting  
24 plate (11) and comprises a stationary half casing (121), a detachable half casing

1 (122) and a fastener (123).

2       The stationary half casing (121) is integrally formed on the mounting  
3 plate (11) and has a toothed ratchet surface (102), an annular rib (124), a  
4 protruding disk (125) and a through hole (126). The toothed ratchet surface (102)  
5 is essentially circular, has a flat non-toothed segment (not numbered)  
6 corresponding to the mounting plate (11) and faces inward. The annular rib (124)  
7 is formed inside the toothed ratchet surface (102) and corresponds to the toothed  
8 ratchet surface (102). The protruding disk (125) is formed concentrically inside  
9 the annular rib (124) and has a center (not numbered). The through hole (126) is  
10 defined in the center of the protruding disk (125).

11       The detachable half casing (122) is attached to the mounting plate (11),  
12 aligned with the stationary half casing (121) to define the arm slot (101) and has  
13 a toothed surface (102) and a through hole (127). The toothed surface (102) in  
14 the detachable half casing (122) corresponds to the toothed surface (102) in the  
15 stationary half casing (121). The through hole (127) is defined completely  
16 through the detachable half casing (122) and aligns with the through hole (126)  
17 in the stationary half casing (121).

18       With further reference to Fig. 2, the inner housing (30) is mounted  
19 pivotally between the stationary and the detachable half casings (121, 122) in the  
20 arm slot (101) in the mounting bracket (10) by the fastener (123), comprises two  
21 half casings (31) and has an arm passage (301), a resilient element holder (302)  
22 and a positioning nub (303). The half casings (31) have aligned pivot holes (311)  
23 and front recesses (312). The arm passage (301) has a front opening (304) and a  
24 rear opening (305). The resilient element holder (302) is formed adjacent to the

1 rear opening (305) and is aligned with the arm passage (301). The positioning  
2 nub (303) extends toward the resilient element holder (302) and defines a gap  
3 (not numbered).

4 The resilient element (40) may be a resilient looped strip, is inserted and  
5 held in the gap between the positioning nub (303) and the resilient element  
6 holder (302) and has two free ends (41). The free ends (41) are bent toward each  
7 other and positioned adjacent to the rear opening (305).

8 The suspension arm (50) is mounted in and extends out of the mounting  
9 bracket (10) through the arm slot (101), abuts the resilient element (40) and has  
10 an insert (51), two toothed protrusions (52), a top edge (not numbered), a bottom  
11 edge (not numbered), multiple annular holes (53) and multiple elongated holes  
12 (54). The toothed protrusions (52) are formed on the insert (51), correspond  
13 respectively to the front recesses (312) in the inner housing (30) and engage  
14 respectively the toothed surfaces (102) in the mounting bracket (10). The insert  
15 (51) is inserted into the arm passage (301) through the front opening (304), is  
16 held in the arm passage (301) and has an inner end (510) and a sliding hole (511).  
17 The inner end (510) abuts and is pressed by the free ends (41) of the resilient  
18 element (40) so the toothed protrusions (52) respectively engage the toothed  
19 ratchet surfaces (102) to hold the suspension arm (50) at a given angular position.  
20 The sliding hole (511) is defined completely through the insert (51), is aligned  
21 with the pivot holes (311) is held in place by the fastener (123) and allows the  
22 suspension arm (50) to move longitudinally within the limits of the sliding hole  
23 (511).

24 The fastener (123), such as a bolt, extends into and is held in the through



1 hole (127) of the detachable half casing (122), the pivot holes (311) in the inner  
2 housing (30), slidably held in the sliding hole (511) of the insert (51) and is held  
3 in and extends out of the through hole (126) in the stationary half casing (121) to  
4 screw into a nut (not numbered). This allows the inner housing (30) to pivot  
5 relative to the outer housing (12) and the suspension arm (50) to move  
6 longitudinally so the toothed protrusions (52) can engage or disengage from the  
7 toothed ratchet surfaces (102).

8           The annular holes (53) and the elongated holes (54) are defined  
9 transversely completely through the suspension arm (50) respectively along the  
10 top and bottom edges. All the annular and the elongated holes (53, 54) can be  
11 used to hang objects.

12           However, a pair of garment rods (1) may be attached to a wall parallel to  
13 each other, and transverse rods (58) can be mounted in the annular holes (53)  
14 between the garment rods (1).

15           With reference to Figs. 1, 3 and 6, the suspension arm (50) is adjusted in  
16 a downward direction by pushing the suspension arm (50) into the outer casing  
17 (12). The insert (51) slides along the arm passage (301), and the inner end (510)  
18 compresses the free ends (41) of the resilient element (40). As the insert (51)  
19 slides along the arm passage (301), the toothed protrusions (51) disengage from  
20 the toothed ratchet surfaces (102) and slide respectively into the front recesses  
21 (312) of the half casings (31).

22           With reference to Fig. 4, the suspension arm (50) is pivoted around the  
23 fastener (123) to a desired annular position while the toothed protrusions (52) are  
24 disengaged from the toothed ratchet surfaces (102). When the suspension arm

1 (50) is in the desired position, the suspension arm (50) is released, and the  
2 resilient element (40) pushes the insert (51) until the toothed protrusions (52)  
3 engage the toothed ratchet surfaces (102). When the toothed protrusions (52)  
4 engage the toothed ratchet surfaces (102), the suspension arm (50) is held  
5 securely in place.

6 With reference to Figs. 1 and 5, a second embodiment of the garment rod  
7 (1) in accordance with the present invention replaces the mounting plate (11) of  
8 the aforesaid garment rod (1) with a post sleeve (59) so the garment rod (1) can  
9 be mounted on a post (591). The post sleeve (59) is slidably mounted on the post  
10 (591). The bracket body (12) including the stationary and the detachable half  
11 casings (121, 122) are attached to the post sleeve (59).

12 The adjustable garment rod (1) in accordance with the present invention  
13 has the following advantages over the prior art. The suspension arm (50) can be  
14 adjusted in a range of 180° from vertical up to vertical down. The bent free ends  
15 (41) of the resilient element (40) provide a larger contacting area abutting the  
16 inner end (510) of the insert (51) than a conventional spring. The restitution force  
17 of the resilient element (40) will push the toothed protrusions (52) to firmly  
18 engage the toothed ratchet surfaces (102), which will efficiently hold the  
19 suspension arm (50) in place.

20 Moreover, the toothed ratchet surfaces (102) permit the suspension arm  
21 (50) to be pivoted upward without pushing the suspension arm (50), which  
22 makes the present invention convenient to use.

23 Even though numerous characteristics and advantages of the present  
24 invention have been set forth in the foregoing description, together with details

- 1 of the structure and function of the invention, the disclosure is illustrative only,
- 2 and changes may be made in detail, especially in matters of shape, size, and
- 3 arrangement of parts within the scope of the appended claims.